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IN THE U.S. PATENT AND TRADEMARK OFFICE

Inventor	Martin GEIER et al	
Patent App.	10/517,675	
Filed	20 July 2005	Conf. No. 1884
For	COMPOSITION FOR ATTRACTING BLOOD SUCKING ARTHROPODS AND FR	
Art Unit	1616	Examiner Fisher, A
Hon. Commissioner of Patents		
Box 1450		
Alexandria, VA 22313-1450		

DECLARATION UNDER 37 CFR 1.132

I, Martin GEIER, a citizen of Germany, residing at Blaue Stern Gasse 7, 93047 Regensburg, Germany, declare as follows:

THAT I have a number of years of experience in the preparation and testing of compositions useful as insect-attractants;

THAT my full curriculum vitae may be attached hereto;

THAT I am the Applicant in US Patent Application Serial No. 10/517,675;

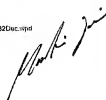
THAT in order to demonstrate that the insect-attracting compositions disclosed in US Patent Application Serial No. 10/517,675 and which include: (a) lactic acid or an acceptable salt thereof; (b) caproic acid or an acceptable salt thereof; and (c) ammonia, in a respective molar ratio of 1: 0.5 - 50: 0.05 to

5, are synergistically effective in that compositions containing these three active ingredients in combination applied to an environment will attract blood-sucking arthropods such as mosquitoes, to a far greater extent than when each of the three individual ingredients: lactic acid, caproic acid and ammonia, is so applied separately to the same environment and that furthermore when the insect-attracting effects of each of the three individual ingredients are added together, and that the insect-attracting effect so obtained of the three combined ingredients is greater than the sum of the insect-attracting effects of the three individually applied insect-attracting compounds, I have either personally conducted or supervised the carrying out of the following tests:


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Tests

For each test, about 20 female *A. aegypti* mosquitoes were used from cultures of Bayer AG in Monheim, 5 - 15 days old, which had no blood meal before. Details of the olfactometer and the experimental procedure are described elsewhere (Geier, M. & Boeckh, *J. Entomol. Exp. appl.* 92, 9-19 (1999); Geier, M. Bosch, O.J. & Boeckh, *J. Chem. Sens.* 24, 647 - 653 (1999). At stimulus onset, the mosquitoes in the start chamber are set free to fly through the olfactometer. During their zig zag flight through the straight tube they encounter alternately air streams from either arm. Following the favoured air stream during upwind flight the mosquitoes enter the respective upwind chamber where they are counted 30 s after stimulus onset. The number of mosquitoes attracted to the chamber serves as the measure for attractiveness of the odor stimulus. Odor stimuli were produced by passing purified air through Erlenmeyer flasks which contain the odor solution (Geier, M. Bosch, O.J. & Boeckh, *J. Chem. Sens.* 24, 647 - 653 (1999); Geier, M. Bosch, O.J. & Boeckh, *J. J. Exp. Biol.* 202, 1639 - 1648 (1999). The relative concentration of each odor stimulus is given with respect to their molar mixing ratios in the gaseous phase. Stimuli: La = Lactic acid, Am = ammonia, and Ca = Caproic acid. Values from 10 trials per treatment are lumped



together. Treatments were tested in random order.

Table: Measurements of attractiveness of different blend compositions for yellow fever mosquitoes *Aedes aegypti* in a Y-tube bioassay. Effectiveness of the blend differs significantly with respect to the mixing ratio of the single compounds.

A handwritten signature in cursive script, appearing to read "Mark J. J.", is located in the lower right quadrant of the page.

Stimulus	Number of tested mosquitoes	Attracted mosquitoes
La1:Am1.8:Ca0.6	206	192
La1:Am1.8:Ca3	201	182
La1:Am5:Ca0.6	200	179
La5:Am1.8:Ca0.6	209	183
La1:Am0.1:Ca0.6	200	169
La1:Am1.8:Ca0.1	206	172
La0.3:Am1.8:Ca0.6	203	180
La1:Am0.01:Ca0.6	198	97
La1:Am50:Ca0.6	200	68
La1:AM1.8:CA30	201	76
La1:Am1.8:Ca0.01	199	79
La50:Am1.8:Ca0.6	205	81
La0.01:Am1.8:Ca0.6	199	79
La1	202	46
Am1.8	200	2
Ca0.6	204	3
Am50	199	11
Ca30	198	8
La50	210	55

THAT based upon the data presented above, I conclude that the compositions according to my patent application and which contain (a) lactic acid or an acceptable salt thereof; (b) caproic acid or an acceptable salt thereof; and (c) ammonia, in a respective molar ratio of 1: 0.5 - 50: 0.05 to 5, are synergistically effective in attracting blood-sucking arthropods, such as mosquitoes, and I further conclude that these compositions consistently attract 85% of the tested mosquitoes, which is a surprisingly high level of attractiveness that I would not have expected;

THAT I am aware that the Examiner has cited Chem. Senses 25: 323 to 330, 2000, Bosch et al, "Contribution of Fatty Acids to Olfactory Host Findings of Female Aedes aegypti", as a basis for concluding that the invention as disclosed and originally claimed in my patent application was either anticipated or obvious and therefore unpatentable;

THAT I am listed as the second author in the abovementioned Bosch et al publication and that I am thoroughly familiar with the test procedures and test results set forth in the publication, since I am one of the experimenters who set up the test protocol and carried out the experiments set forth in the publication;

THAT in my opinion the high level of synergistic attractiveness demonstrated toward the tested mosquitoes by my abovementioned insect attracting compositions which contain (a)

lactic acid or an acceptable salt thereof; (b) caproic acid or an acceptable salt thereof; and (c) ammonia, in a respective molar ratio of 1: 0.5 - 50: 0.05 to 5, would not have been expected from reading the Bosch et al publication because Figure 4 at the top of page 328 of BOSCH et al.

THAT Bosch et al do not specifically disclose any insect-attracting compositions that contain lactic acid, caproic acid and ammonia and do not present any test data for such compositions at any weight ratio, let alone in a respective molar ratio of 1: 0.5 - 50: 0.05 to 5 according to my invention;

THAT Bosch et al present test data in Table 4 showing the overall ability of combinations of lactic acid, ammonia with either a C₃ fatty carboxylic acid, a C₅ fatty carboxylic acid, or a combination of the C₃ and the C₅ carboxylic acids and specifically show that, a combination of lactic acid with either a C₃ or a C₅ fatty carboxylic attracts about 50% of the mosquitoes tested and further show that when both the C₃ and the C₅ carboxylic acid are employed together with the lactic acid, there is an improvement from a rate of 50% attractiveness to about 68% attractiveness;

THUS I conclude that the rate of insect attractiveness of 85% achieved according to the compositions according to my invention which contain (a) lactic acid or an acceptable salt

thereof; (b) caproic acid or an acceptable salt thereof; and(c) ammonia, in a respective molar ratio of 1: 0.5 - 50: 0.05 to 5, would not have been expected from reading the Bosch et al publication;

THAT I a aware of no data inconsistent with those presented above or which would lead one to a contrary conclusion; and

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 USC 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

22/02/2009

Date



Martin Geier

Curriculum vitae: Dr Martin A. Geier, Dipl. Biol., Dr. rer. nat.**1. Employment History.**

- 2002 - present *Employer:* BioGents AG, Regensburg, Germany.
BioGents was founded in November 2002 as a spin-off from the University of Regensburg. BioGents converted into a stock corporation in September 2007. The company is specialized in the development and commercialisation of insect trapping systems, chemical attractants, and repellents for the use of the environmental friendly control of mosquitoes and other pest insects.
Position: Member of the board of directors and founding partner.
Responsibilities: Strategic planning, planning and funding technology, and marketing. Project development with focus on insect traps and lures. Supervision of R&D activities.
- 2002 – present Lecturer in animal physiology (part time) at the University of Regensburg. Head of the mosquito research group. Research topics are:
- Chemical Ecology of blood sucking insects.
- Sensory Ecology and Sensory Physiology of blood sucking insects.
- Medical Entomology of mosquito vectors.
- 1998 - 2002 *Employer:* Institute of Zoology, Departments of Biology, University of Regensburg, Germany.
Position: Assistant Professor.
Responsibilities: Head of the mosquito research group.
Teaching: lectures in Zoology, practical courses in Zoology, practical courses in animal physiology.
- 1997 - 1998 *Employer:* Department of Entomology, University of California, Riverside, USA; with support of the DFG (German Research Foundation).
Position: Research Associate in the group of Prof. R. Cardé.
Responsibilities: Research: Development of a 3D video tracking system to analyze the orientation of mosquitoes flying towards their hosts. Studies on the influence of the fine scale plume structure on the orientation behavior.
- 1995 - 1997 *Employer:* Institute of Zoology, Departments of Biology, University of Regensburg, Germany.
Position: Research Associate in the group of Prof. J. Boeckh.
Responsibilities: Research: Collaborator in the development of the new repellent Bayrepel® of the Bayer AG. Teaching: Sensory physiology and orientation of insects, practical course in Zoology.
- 1991 - 1995 *Employer:* Institute of Zoology, Departments of Biology, University of Regensburg, Germany.
Position: Assistant Scientist and PhD student in the group of Professor Jürgen Boeckh.
Responsibilities: Research: The olfactory host finding behaviour of the yellow fever mosquito *Aedes aegypti*. Teaching: Seminars and courses on the host finding of bloodsucking insects – behaviour and neuronal base of perception.


1

2. Education.

- 1985 - 1987 University of Regensburg, Germany.
Studied Zoology, Genetics, Physics, Chemistry.
- 1987 - 1991 University of Regensburg, Germany.
Studied Zoology, Genetics, Biochemistry, Psychology.
Qualification: Diploma in Biology (Dipl. Biol., equiv. M.Sc. Biology).
Thesis: "Electrophysiological investigations of olfactory receptor cells for host odours and repellents on the antenna of the mosquito *Aedes aegypti*."
Advisor: Prof. Dr. Jürgen Boeckh.
- 1991 - 1995 Institute of Zoology, Department of Biology, University of Regensburg, Germany.
Qualification: Doctor of Science (Dr. rer. nat., equiv. PhD)
Thesis: "Exploring the attractive host odour pattern for yellow fever mosquitoes *Aedes aegypti*: a behavioural study." Advisor: Prof. Dr. Jürgen Boeckh.

3. Membership of Professional Institutions.

Member of the American Mosquito Control Association (AMCA).

Member of the Institute of Biodiversity Network (IBN).

4. Management Experience and Personal Development.

Regensburg University I was the head of a entomology research group and responsible for raising external funds. I was in charge of research assistants, technicians, and I have supervised 18 postgraduate research students.

BioGents AG Together with Dr Andreas Rose and Markus Siegers, I am responsible for a team of 9 people. During the last 7 years, I have attended management development courses and programs to develop my skills in strategic planning, product development, marketing, finance, business administration, and human resource management.

5. Consulting Experience.

I have consulted for a number of companies and institutions in Germany, such as the Bayer AG during the development phase of the new repellent Bayrepel®, SME's that have planned to develop new products in the pest control market, and consumer protection organisations that do product testing and comparison.



16/02/2009